

# **Historic, Archive Document**

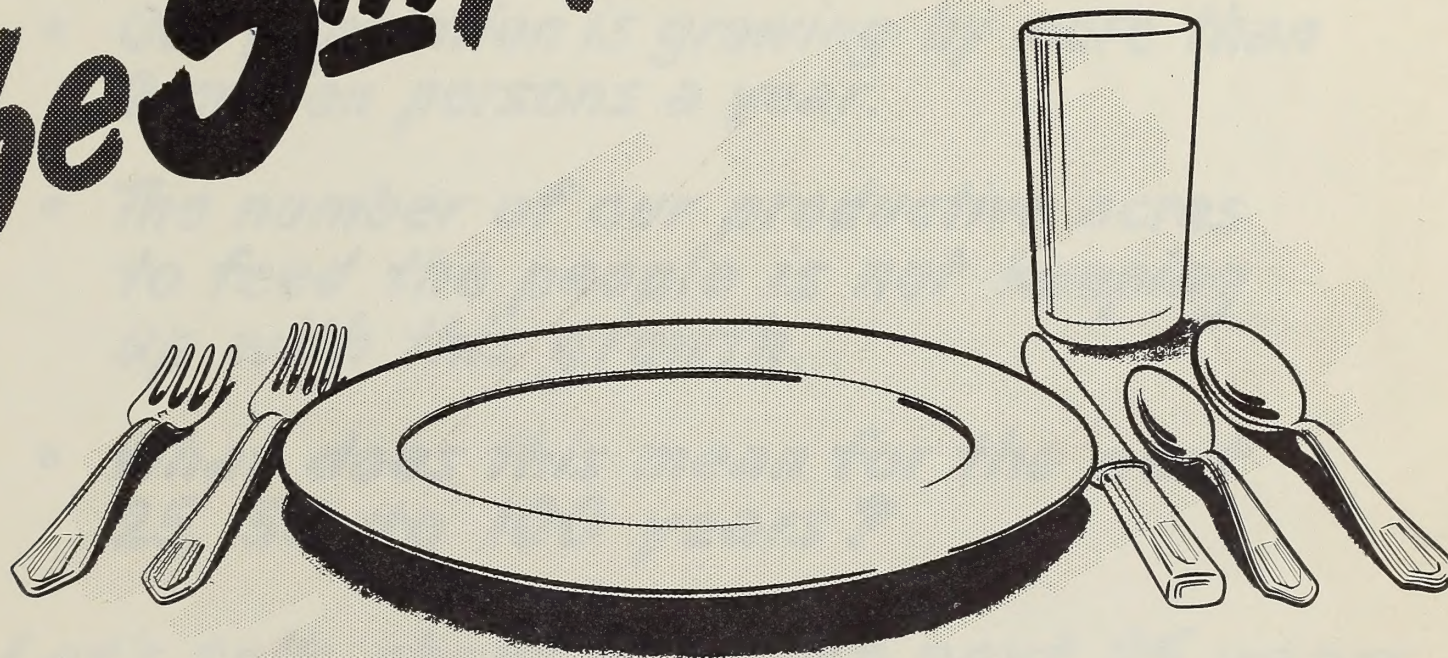
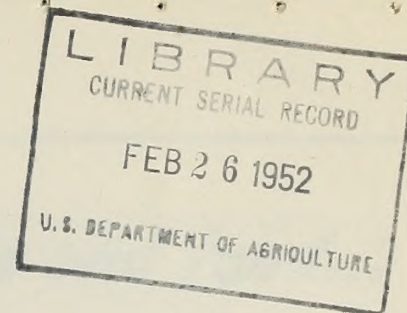
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1  
Pg 84 Pro  
Cap 5

# The 5<sup>th</sup> Plate



**U. S. DEPARTMENT OF AGRICULTURE**  
**PRODUCTION AND MARKETING ADMINISTRATION**

PA - 191

December 1951





***This is a story of land, people and food...***

- ***Our population is growing by more than 2 million persons a year.***
- ***The number of our productive acres to feed the people is not keeping up with this growth.***
- ***What does this mean for the next 25, 50, to 100 years?***

***Let's talk about only the next 25 years...***



This chart shows how our population is growing. The number of people is increasing at an average rate of more than 6,000 persons a day, 250 persons every hour, and 4 persons every minute.

This is a NET increase.

The projection of population to 1975 is the medium estimate of the Bureau of the Census, made in 1950. At the present rate of increase, the U. S. population would exceed 200 million persons by 1975.

At the bottom of the chart, the 38 million increase in population over 1950 is represented by the populous Northeastern States. This increase could also be

represented by the last Census count of people in:

8 Midwest States -- Ohio, Indiana, Illinois, Michigan, Wisconsin, Iowa, Missouri, and Minnesota.

18 Western States -- Washington, Oregon, California, Montana, Idaho, Wyoming, Utah, Nevada, Arizona, Colorado, New Mexico, Texas, North Dakota, South Dakota, Nebraska, Kansas, Oklahoma, and Missouri.

All the Southern States -- Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida, Kentucky, Tennessee, Alabama, Mississippi, Louisiana, Arkansas, Oklahoma; and Kansas.

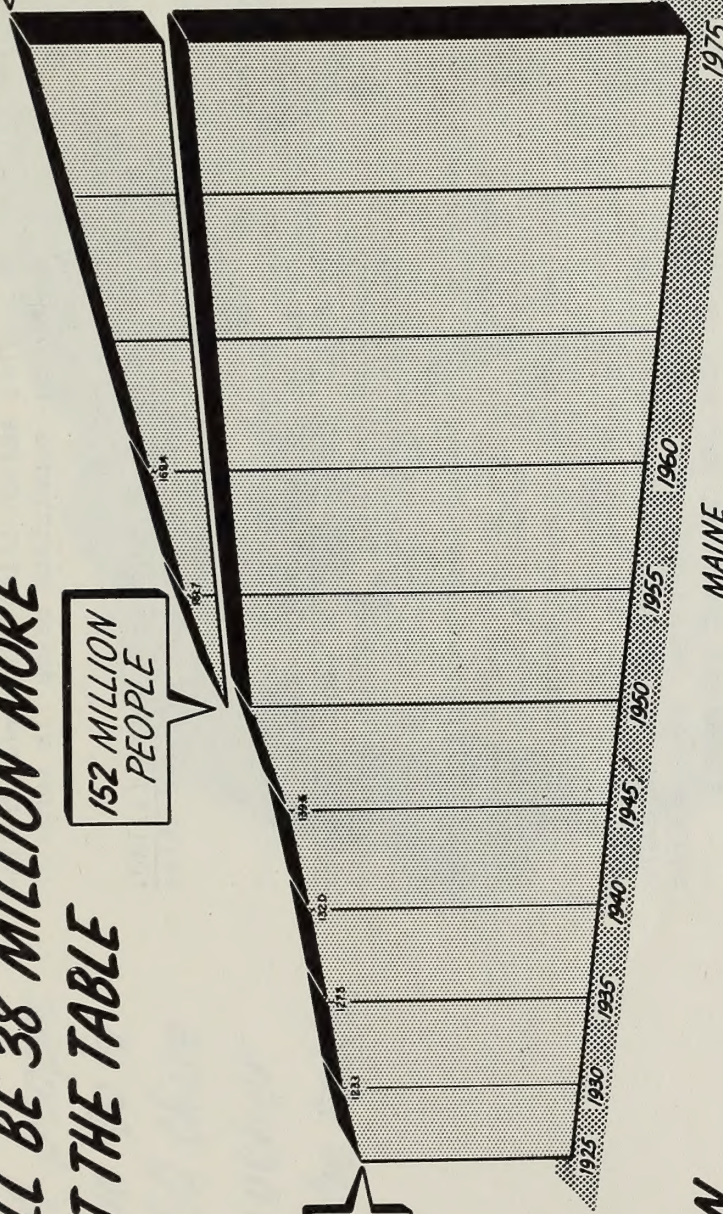


**THERE WILL BE 38 MILLION MORE  
PEOPLE AT THE TABLE  
BY 1975**

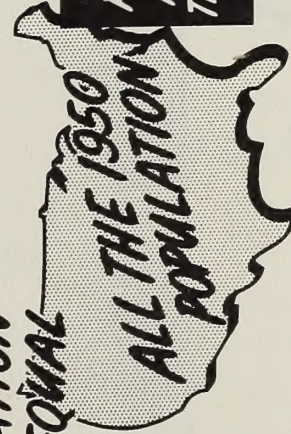
**190 MILLION  
PEOPLE**

**152 MILLION  
PEOPLE**

**116 MILLION  
PEOPLE**

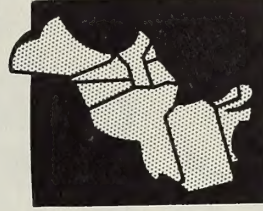


**THE 1975  
POPULATION  
WILL EQUAL**



**PLUS ALL THE  
PEOPLE OF  
THESE STATES**

MAINE  
NEW HAMPSHIRE  
VERMONT  
MASSACHUSETTS  
RHODE ISLAND  
CONNECTICUT  
NEW YORK  
PENNSYLVANIA  
MARYLAND  
DELAWARE





This sketch illustrates what the increase in population means in terms of food.

It means another plate to be filled.  
This plate will have to be filled three  
times a day, 365 days a year.

We are getting more consumers of food. We are not getting more producers of food. The number of people on farms has been declining steadily, and the trend is still down.

Our present farm production is not enough to fill the 5th plate if we are to eat only as well as we eat now, and take care of necessary exports, too.

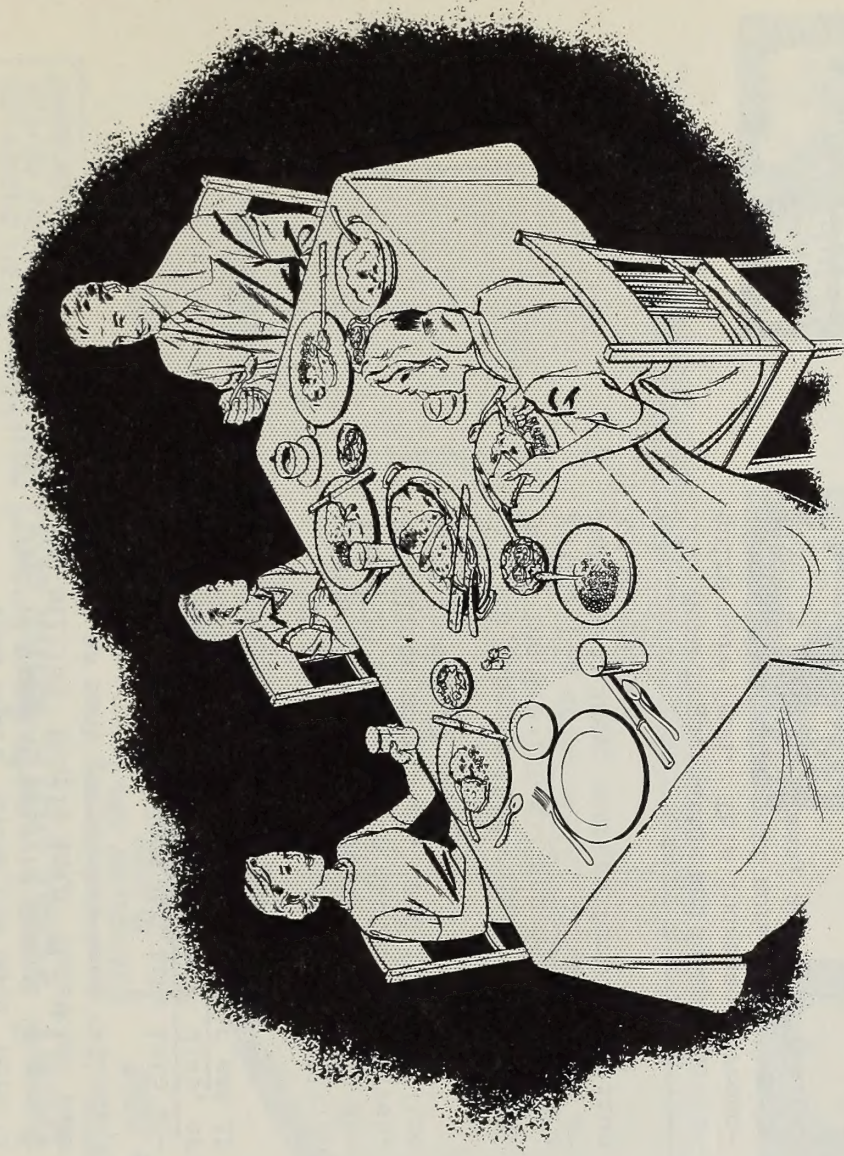
How much more meat, milk, and eggs will be needed to supply the oncoming population with about the same amounts as we have had in recent years?

The next few charts tell this story.





*For every 4 people  
sitting down to a  
meal in 1950 there  
will be another  
person at the table  
in 1975*



*AGRICULTURE'S JOB IS TO FILL  
THE 5th PLATE*



This chart shows how much more of the "red meats" will be needed to supply 190 million people with about the same amount as each person has been eating.

The increase does not take into account any improvement in meat diet, or how much more meat people would eat if they had it and could afford it.

To produce the additional  $5\frac{1}{2}$  billion pounds needed would require annual slaughter of 10 million more cattle and calves, 20 million more hogs, and  $3\frac{1}{3}$  million more sheep and lambs.

To support this volume of slaughter would require 100 million head of cattle, yearly pig crops of 121 million, and an increase in sheep numbers from 30 million to 38 million.

More hogs, cattle and sheep will require more feed. This increased production will require that more attention be given to forage, grass, and feed grains.



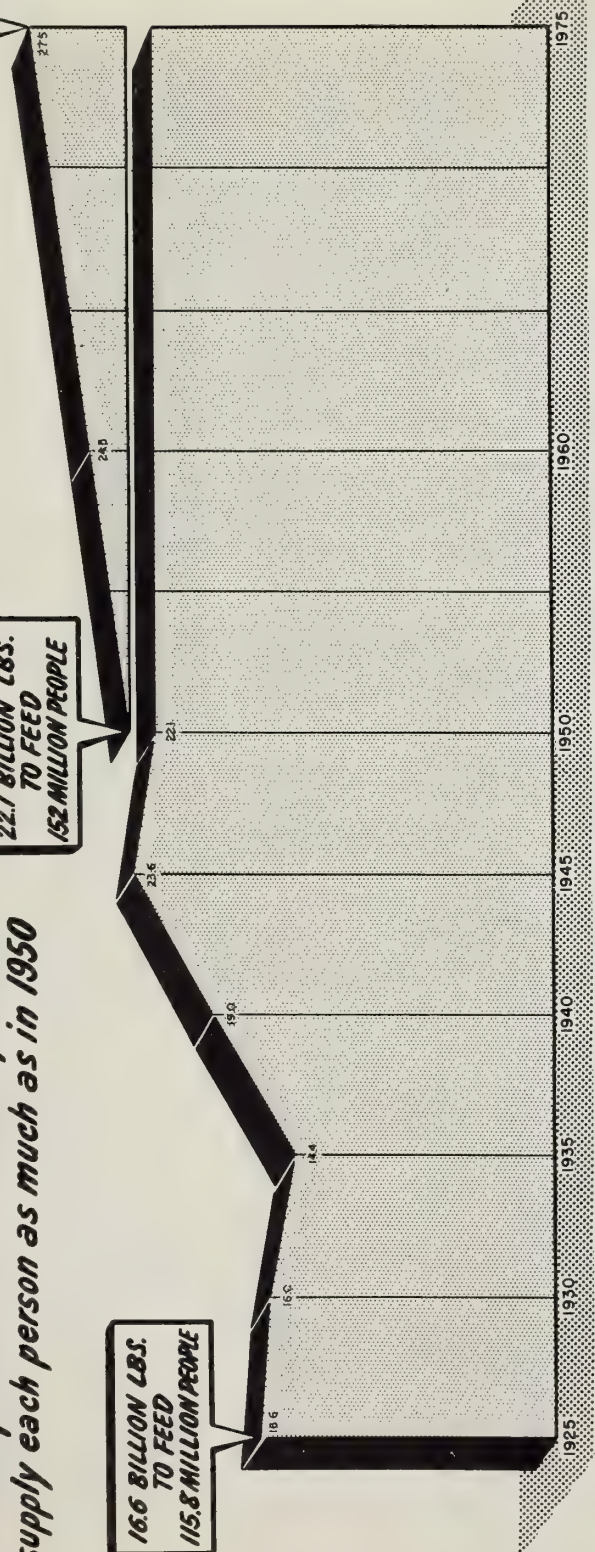
# MEAT PRODUCTION (beef, veal, pork, lamb and mutton)

5½ billion pounds more needed by 1975  
to supply each person as much as in 1950

27.5 BILLION LBS.  
NEEDED TO FEED  
190 MILLION PEOPLE

22.1 BILLION LBS.  
TO FEED  
152 MILLION PEOPLE

16.6 BILLION LBS.  
TO FEED  
115.8 MILLION PEOPLE



The 5½ Billion  
Lbs. Increase  
Is Equal To:

1950  
PIG  
CROPS  
OF:  
NEBR.  
IOWA



1950  
COW  
NOS.  
OF:  
OKLA.  
TEXAS  
MINN.

PLUS

1950  
LAMB  
CROPS  
OF:  
NEV.  
UTAH  
MONT.  
WYO.

PLUS

This chart shows how much more milk will be needed to supply 190 million people with as much as there is for each person now.

We have been producing approximately a quart of milk a day for each person. This quart of milk must provide for all the cheese, butter, ice cream, and other dairy products, as well as milk for drinking and cooking.

To give 190 million people as much milk as each person has now, production would have to be increased to about 70 billion quarts. The largest amount we have ever produced was a little less than 60 billion quarts.

To produce this much milk we would need: Either 6 million more milk cows, or an additional 1,323 pounds (615 quarts) each year from each cow.

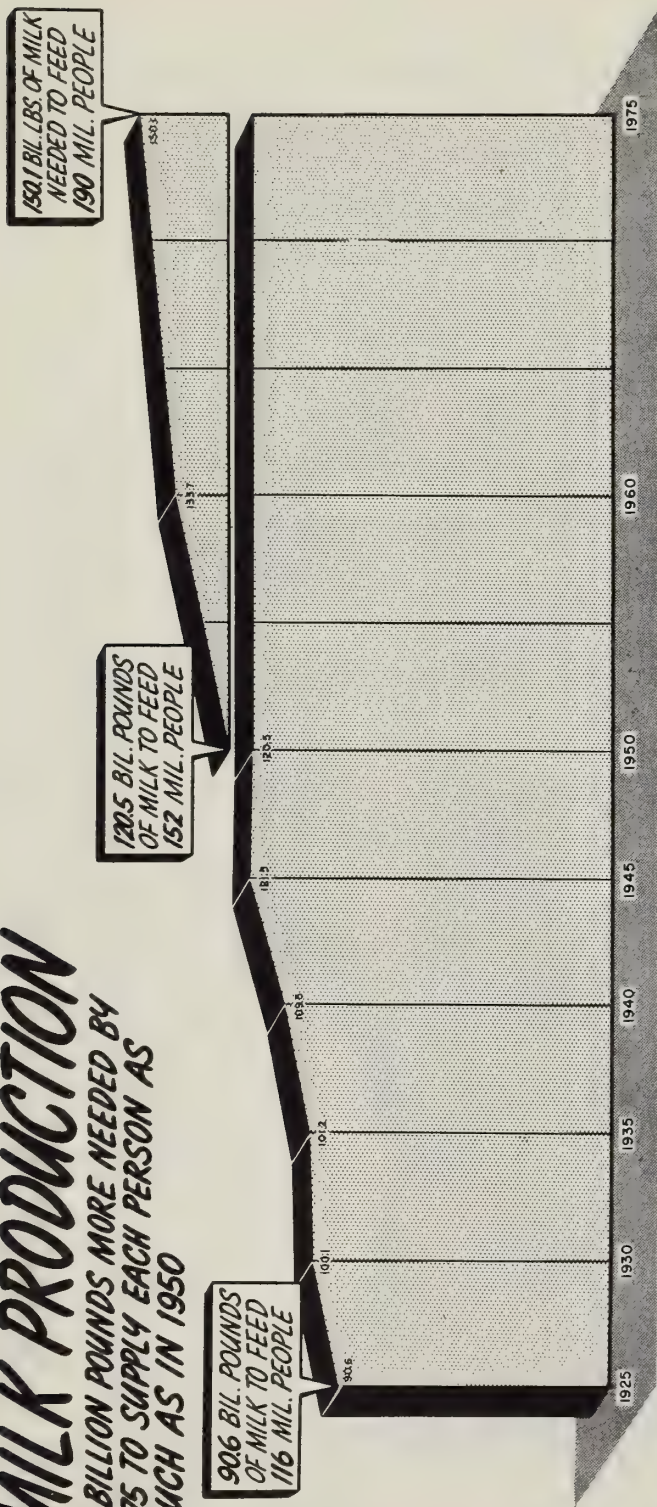
Actually, the increase will have to come from both sources: Some increase in number of cows and some increase in production per cow.

Again, this means we must have more improved hay and pasture lands, and better management of our forage crops.



# MILK PRODUCTION

30 BILLION POUNDS MORE NEEDED BY 1975 TO SUPPLY EACH PERSON AS MUCH AS IN 1950



THE 1950 MILK PRODUCTION OF

THE 30 BILLION POUND INCREASE IS EQUAL TO:



This chart shows how many more eggs will be needed to supply 190 million people with as many as there are for each person now.

We have been producing close to 395 eggs a year for each person. To feed 190 million people this number of eggs annually, production would have to be increased by 14.7 billion eggs or about 1 $\frac{1}{4}$  billion dozen.

This production would require either 87 million more layers, or an increase in the rate of lay of about 43 eggs per hen -- from 167 eggs a year in 1950 to 210 a year. Rate of lay has gone up rapidly in recent years.

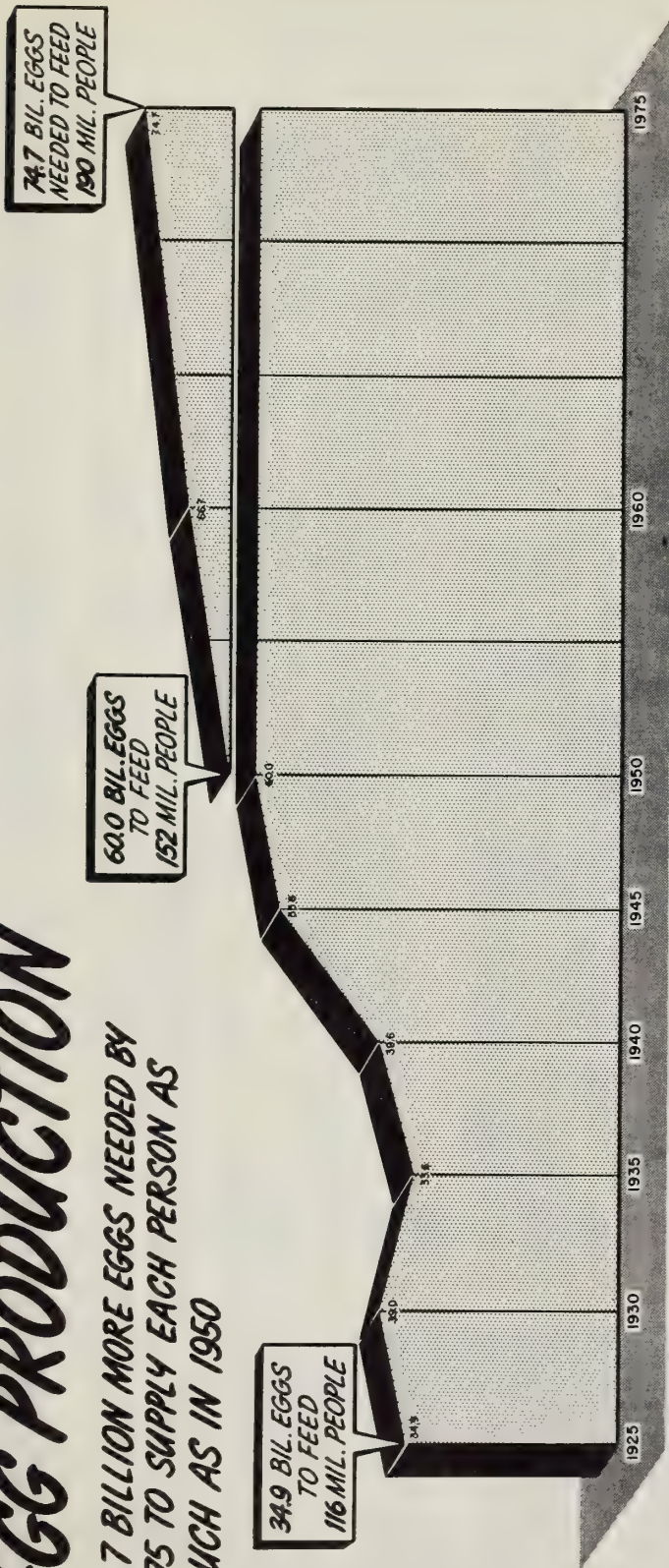
As in the case of milk, the increase probably will have to come from two sources -- from a somewhat larger laying flock and an increase in production per hen.

Again, we will need more feed, grains, and protein.

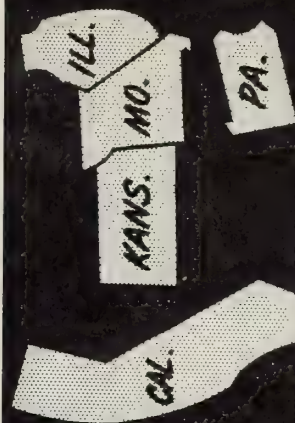


# EGG PRODUCTION

14.7 BILLION MORE EGGS NEEDED BY 1975 TO SUPPLY EACH PERSON AS MUCH AS IN 1950



The 14.7 Billion Increase Is Equal To:



THE 1950 EGG PRODUCTION OF

This chart is a summary of how much more milk, meat, and eggs will be needed if all of us eat as well in 1975 as we are eating now.

The increases in production needed by 1975 represent approximately one-fourth of the amounts we were producing in 1950. They do not, however, allow for any improvement in diet.

In other words, for every four pounds of meat, four quarts of milk, and for every four eggs we have been producing, we will need another pound, another quart, or another egg to supply the 5th person at the table by 1975.


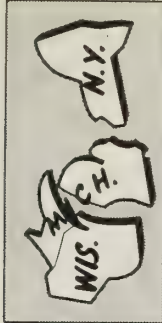

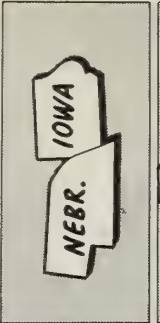

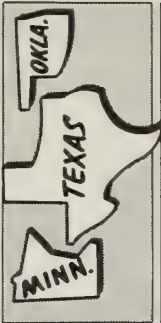

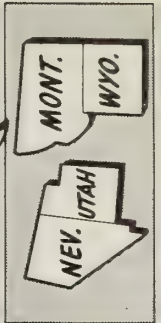

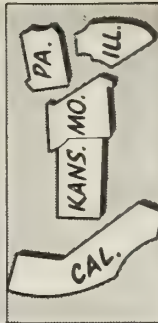
We hope that all of us can eat better too. To provide an adequate diet for all of us now would require more of the health-giving foods than we are producing.



# 1975 MILK, MEAT, AND EGG REQUIREMENTS SUMMARIZED

to supply each person as much as in 1950 we would need:

... ALL WE PRODUCED IN 1950

	<p><i>plus</i></p> <p>FOR MILK THE 1950 PRODUCTION OF THESE STATES</p>	
	<p><i>plus</i></p> <p>FOR PORK THE 1950 PIG CROPS OF THESE STATES</p>	
	<p><i>plus</i></p> <p>FOR BEEF AND VEAL THE 1950 COW NUMBERS OF THESE STATES</p>	
	<p><i>plus</i></p> <p>FOR LAMB AND MUTTON THE 1950 LAMB CROPS OF THESE STATES</p>	
	<p><i>plus</i></p> <p>FOR EGGS THE 1950 PRODUCTION OF THESE STATES</p>	

This chart shows how rapidly farm production has gone up in recent years. It also shows how much more production will be needed to supply 190 million people by 1975 with about our present level of use.

In the years before 1936, total farm production was neither very much above nor very much below the 1935-39 average, except for the drought period.

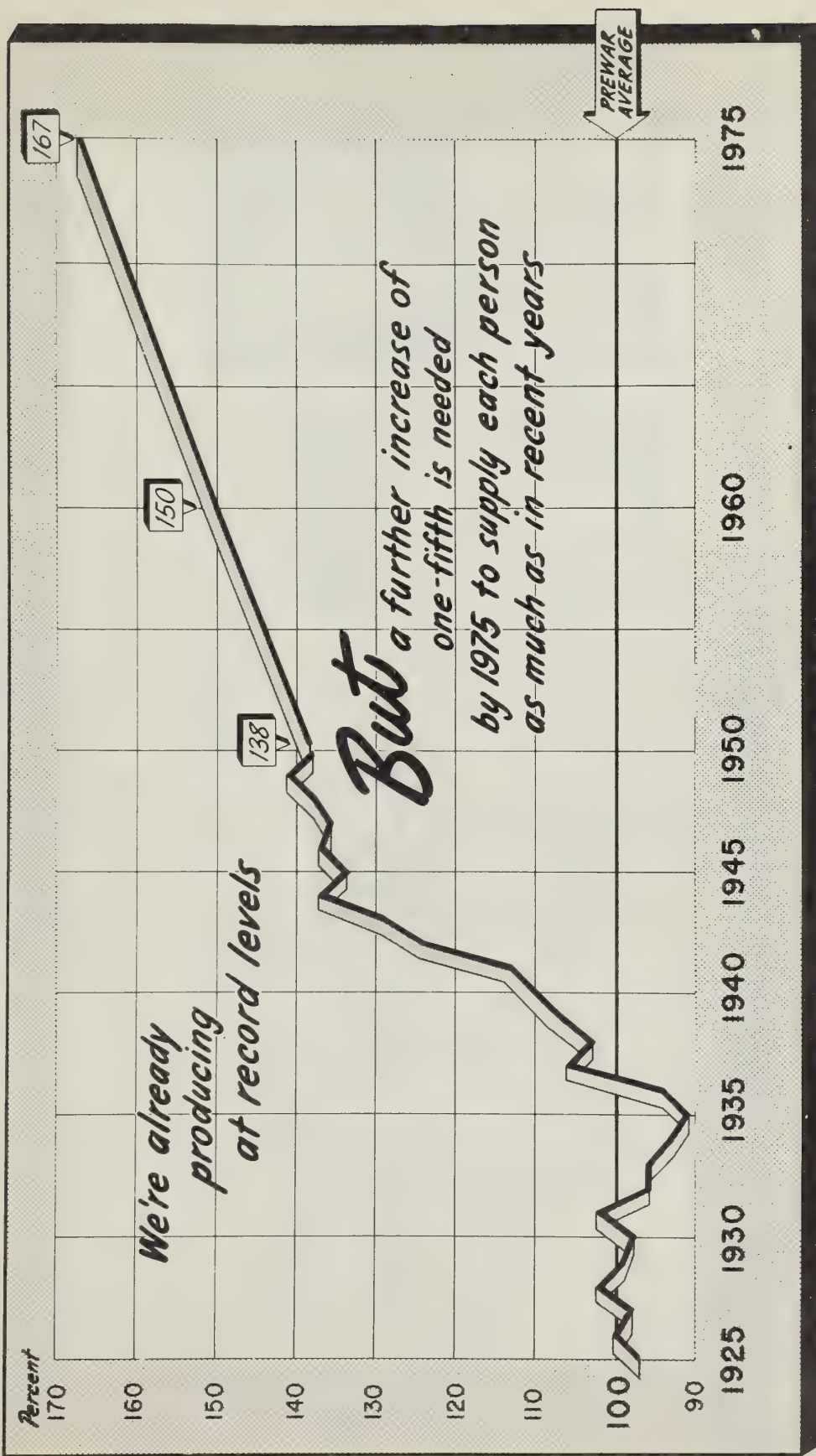
After 1936, total production started a fast climb, hitting a peak in 1949. In 1950, total production was 38 percent above the average line. It was 41 percent above average again in 1951.

The yearly rate of increase required from 1950 to 1975 is practically the same as the yearly rate of increase for the last 5 years. 1952 production goals call for 49 percent more than the prewar (1935-39) average, or nearly as much as the 1960 "normal" requirement shown on the chart.

We are producing at record levels now. But if we are to supply 38 million more people as well as we are supplied now, production will have to move on up at least a fifth above 1950. The increase of one-fifth makes allowance for some additional cropland coming into food production during the period.



# PRODUCTION OF ALL FARM COMMODITIES



A number of studies show that about 100 million more acres of cropland, or its equivalent, would be required in 1975 to supply each person with as much as we have had in recent years -- if all the additional production had to come from new land.

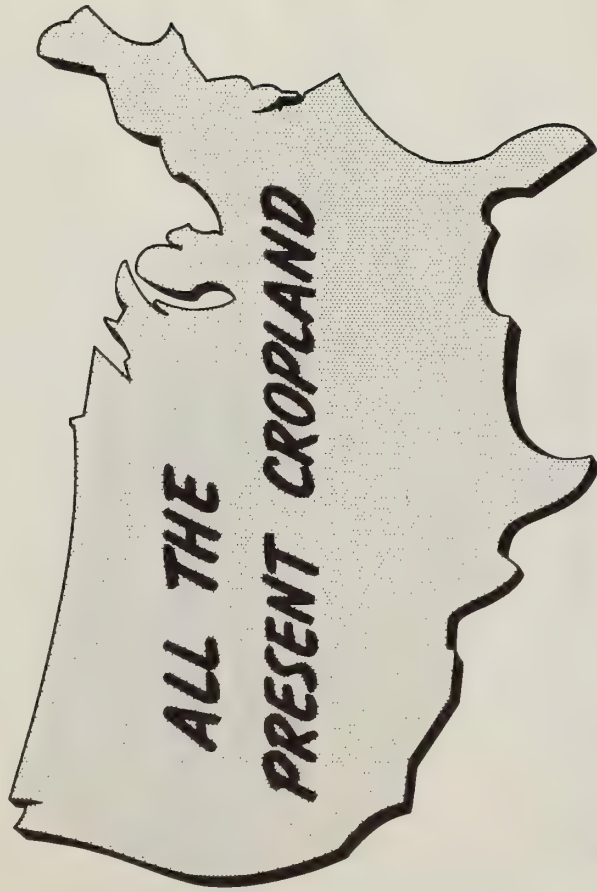
For nearly 400 years we have been able to take care of the increase in population by moving west and opening up new land. This is no longer possible.

Only a fraction of the total increase in production that will be needed can come from opening up new land. Most of the additional production must come from "building up" present acres -- through a vertical increase rather than a horizontal increase.

Since 1920 the decline in horses and mules has released 65 million acres for the production of food instead of feed. Horse and mule numbers are now down to less than 7 million head. Not much further decline in numbers is possible. Not much additional land for production of food can be expected from this source.



**WE COULD GET THE NEEDED INCREASE**  
if we could find another 100 million acres of cropland



*an amount equal to the  
cropland in these states*

**THIS MUCH NEW LAND  
IS NOT AVAILABLE**

**BUT THERE  
IS A WAY** } *By making every 5 of our present  
acres produce as much as 6*

The top chart shows yields per acre for the last 25 years compared with the 1935-39 average.

The bottom chart shows production per unit of livestock for the last 25 years compared with the 1935-39 average.

The total acreage in cropland has changed little since World War I. Yields of major crops fluctuated only moderately from the average for the first 35 years of this century. Then yields went up rapidly after 1936.

Conservation farming has contributed to this increase. Many other things have also helped: Improved crop varieties, much greater use of lime and fertilizers,

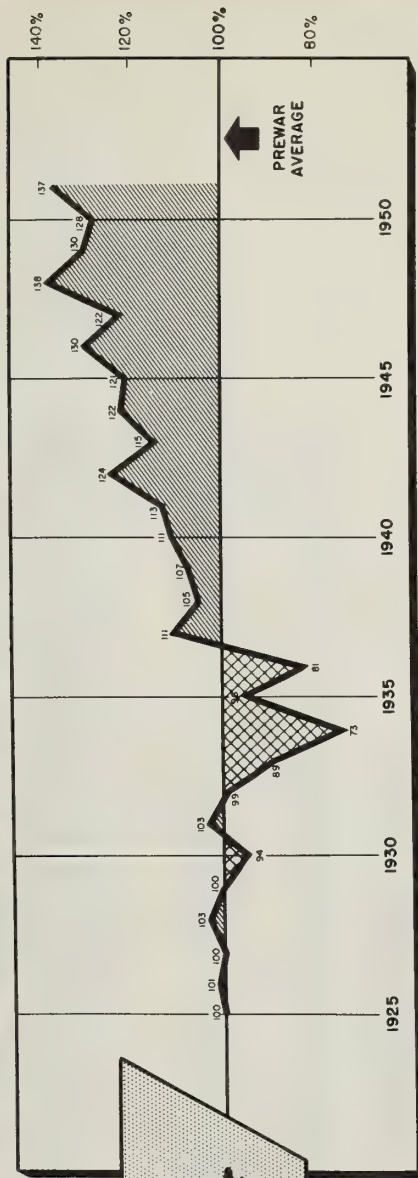
better control of pests, development of weed killers, the increase and improvement in farm machinery, expansion of electricity to rural areas, and so on.

In the case of livestock, the number of breeding units has increased. Conservation and improvement in grasslands have contributed. Better breeds, better forage, higher rates of grain feeding, more adequate watering facilities, improved pest control -- all have helped to increase animal production.

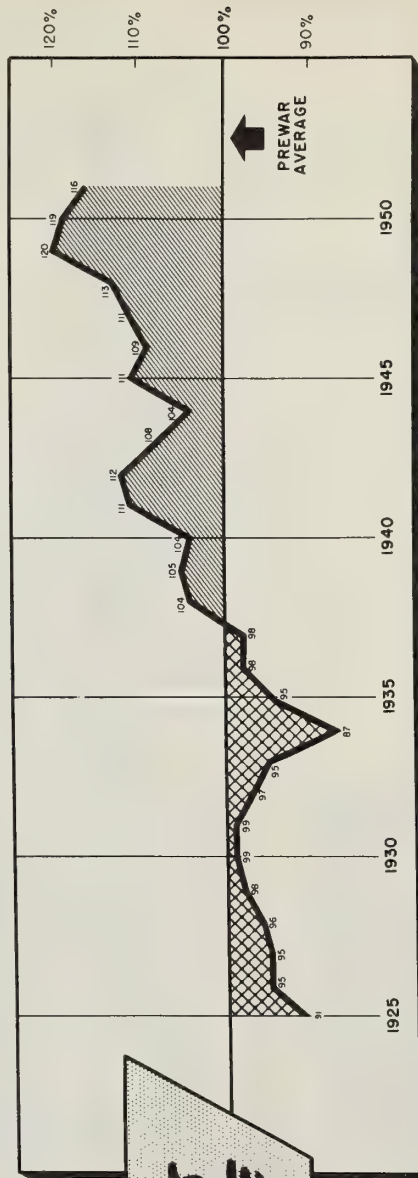
In the case of both crops and livestock, a more favorable level of farm prices, and credit at reasonable rates have contributed to the rapid building up of production in recent years.



# WE HAVE KEPT PACE WITH POPULATION BY BUILDING UP ACRES



**EACH ACRE IS  
PRODUCING MORE**



**EACH ANIMAL IS  
PRODUCING MORE**

Many people take their food for granted because it's always available at the grocery store, or delivered at the door.

There's an old saying that it takes three generations to make a farm. Many years of hard, intelligent work, research, education, practical farming experience, and a huge capital investment stand back of the high level of production we have today.

Present day farming requires a large investment in land, machinery, electrical equipment, livestock, seeds, fertilizers, chemicals, and so on. Present-day farming can rely on no one thing for success.

Agriculture must be supported by continued research to meet changing problems, adequate modern tools and facilities for production, credit at reasonable rates, and a fair level of prices to sustain an abundant production.

Conservation systems of management for soils, water and woodland resources are essential -- both to obtain the necessary production now and to build up productive capacity to meet continually expanding needs.



**OUR ACRES MUST BE BUILT UP STILL MORE  
IF WE ARE TO MEET FUTURE FOOD REQUIREMENTS**

*All these will be needed in combination...*

- *the application of research*
- *balanced conservation*
- *expansion of fertilizer capacity*
- *farm machinery, equipment and electrical power*
- *adequate credit*
- *fair farm prices*

This chart shows how much the use of lime spread through the Agricultural Conservation Program increases production in one year. The information is based on a study made in 1951 by soils scientists of the Department of Agriculture and State experiment stations.

The study makes it possible for the first time to express the value of a ton of lime in terms of actual production on a regional or national basis.

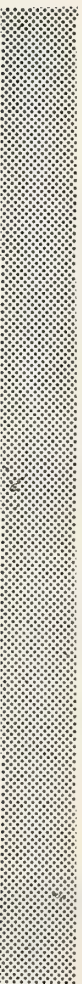
The data shown on the chart are for only the eastern half of the United States -- the humid area where most of the lime is used.

Within the area shown on the map, 1 ton of lime was responsible for an

average of an additional 4/5ths of a ton of hay or pasture forage in one year.

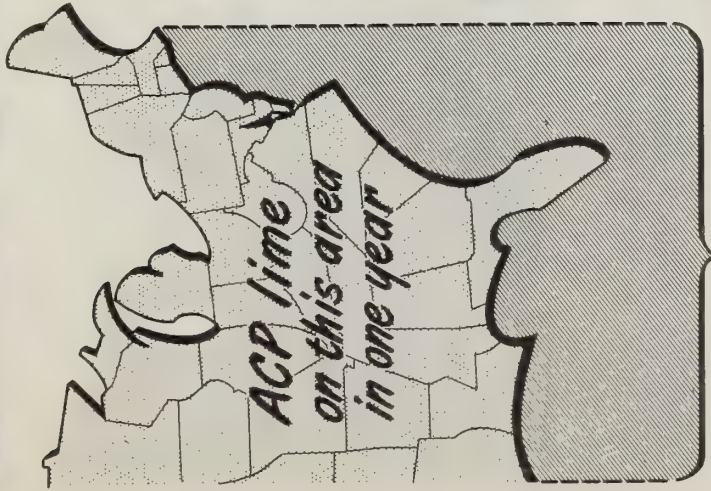
Soil scientists consider this a conservative estimate of the contribution of lime. Good legume crops are an essential for soil improvement. Alfalfa and clover won't grow **successfully** on soils deficient in calcium. Lime corrects this condition and helps to make possible production of high-quality legume crops.

The figures at the bottom of the chart do not take into account the improvement in quality of forage due to use of lime. They represent the contribution toward increased production from lime for one year only. The response from lime is practically as great in the second and third year as in the first year.





# WE CAN BUILD UP ACRES BY USING LIME



24 MILLION TONS SPREAD  
THROUGH ACP IN 1949

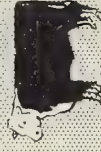


INCREASED HAY  
AND PASTURE  
FORAGE EQUAL TO  
THE PRODUCTION  
OF THESE STATES

**RESULT**



20 million tons more  
hay and pasture  
forage...



... if converted to BEEF,  
the increase equals 1½  
billion pounds, liveweight

This chart shows the increases in production in one year from the phosphate spread through the Agricultural Conservation program. This information also is based on the report by soils scientists indicating average response of crops to fertilizers and lime.

Three million tons of phosphate materials (20 percent  $P_{205}$  equivalent) were spread through the ACP in 1949 for soil-conserving purposes. Participating farmers paid for more than half the cost out of their own pockets.

Before 1936, very little phosphate was used on pasture, hay, and cover crops. Such fertilizer as was used went almost entirely on cash crops. Research had long shown that the use of phosphate on hay and pasture increased yields, as well as improved the quality of the forage.

In 1936, about 120,000 tons of 20 percent superphosphate were used on hay, pasture, and cover crops under the ACP.

From this small beginning, the use of phosphate for soil-building purposes climbed to more than 3 million tons in 1950. In addition, such uses through commercial sales is increasing.

Annual use of phosphate on soil-building and soil-conserving crops still needs to be increased three times over the present 3 million tons a year, according to soil scientists.

However, there is a shortage of sulfur used to break down the phosphate rock.

Any big increase in the use of phosphate will have to be postponed until greater supplies are available.



# WE CAN BUILD UP ACRES BY USING PHOSPHATE WHEN AVAILABLE



INCREASED HAY  
AND PASTURE  
FORAGE EQUAL TO  
THE PRODUCTION  
OF THESE STATES



3 MILLION TONS USED FOR  
CONSERVING PRACTICES IN 1949

**RESULT**



23 million tons more  
hay and pasture  
forage...



...if converted to BEEF,  
the increase equals 1.7  
billion pounds, liveweight

This chart illustrates how grasslands can be built up "vertically." The value assigned to an improved pasture over an unimproved pasture is supplied by crop and livestock specialists.

Only in recent years have we begun to recognize grass -- hay and pasture -- as one of our important crops. Meeting future food requirements for meat and milk will depend mainly on increasing and improving the supply of forage.

Hay and pasture supply nearly half of the total feed for all livestock. More than 60 percent of the feed for dairy cattle comes from hay and pasture. Grass

supplies nearly three-fourths of the feed for beef cattle, and 90 percent of the feed for sheep and goats.

W. M. Myers, Director of Field Crops Research, Bureau of Plant Industry, Soils, and Agricultural Engineering, says:

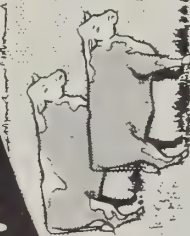
"There are almost a billion acres of permanent grasslands in the United States, and most are unimproved. Experiments and farmer experience show that production from much of this land can be doubled or trebled by fertilization, re-seeding to adapted grasses and legumes, and management practices to insure greatest production and use."



**WE CAN BUILD UP ACRES BY IMPROVING PASTURES**

**1 ACRE OF IMPROVED PASTURE WILL DO  
THE WORK OF 2 OR MORE UNIMPROVED**

**ONE IMPROVED PASTURE**



**EQUALS**

**TWO UNIMPROVED PASTURES**



**50 MILLION ACRES IMPROVED THROUGH ACP SINCE 1935**

This chart gives a conservative estimate of the increase in production from turning under a good green manure crop. In many areas the increase resulting from this practice is greater. Growing legumes is the way farmers produce some of their own nitrogen fertilizer.

Dr. Emil Truog, soils scientist at the University of Wisconsin, writing in the 1947 Yearbook of Agriculture, said:

"In the atmosphere over every acre of land there are, in round numbers, 35,000 tons of nitrogen \* \* \*. How can the farmer draw upon this tremendous and inexhaustible supply of nitrogen?

"He can do so by growing legumes which, when properly inoculated and grown on land well supplied with lime and mineral nutrients, have the power of fixing atmospheric nitrogen that they can then use for the synthesis of their own proteins, and pass on for use by other plants as well as animals."



# ***WE CAN BUILD UP ACRES BY USING GREEN MANURE CROPS***

***TURNING UNDER A GOOD LEGUME  
BOOSTS CORN YIELDS 10 TO  
12 BUSHELS PER ACRE***



***250 MILLION ACRES TURNED UNDER THROUGH ACP SINCE 1935***

Experiments have consistently demonstrated that soil moisture and soil fertility must go hand in hand for the most effective production. Higher yields which result from improved soil and crop practices require adequate moisture.

There are real opportunities for making more efficient use of the rainwater that falls on the land. In the humid area east of the Mississippi we are losing about a third of the annual rainfall through runoff.

The Soil Conservation Service found in Indiana that the soil, not given conservation treatment lost 12.6 percent of

the rainfall during the growing season. Runoff after conservation treatment amounted to only 5.1 percent. Conservation farming saved 7½ percent more of the rainfall during the growing season.

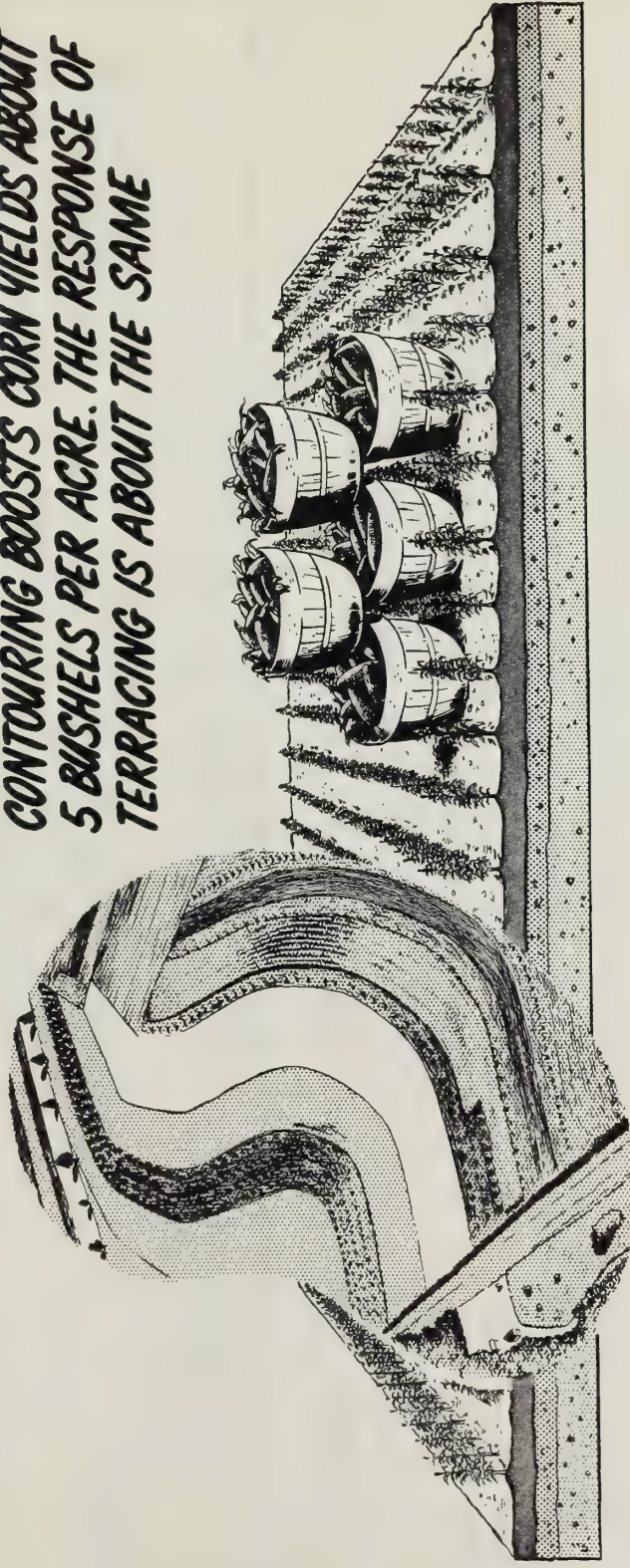
Farming on the contour, stripcropping, and terracing can reduce water runoff and erosion losses, and increase crop yields on millions of acres of sloping land.

Drainage, on the other hand, removes excess water so that crops can reach peak growth. The Soil Conservation Service has done an outstanding job of directing public attention to the need for such practices.



# ***WE CAN BUILD UP ACRES BY CONTOURING AND TERRACING***

***CONTOURING BOOSTS CORN YIELDS ABOUT  
5 BUSHELS PER ACRE. THE RESPONSE OF  
TERRACING IS ABOUT THE SAME***




***130 MILLION ACRES CONTOURED THROUGH ACP  
950,000 MILES OF TERRACES CONSTRUCTED SINCE 1935***

The Nation is receiving a far greater return from the western rangeland than it did 20 years ago. These two charts show the improvement in beef production -- due largely to improvement in quality and supply of feed, an increase in the limited water supply and better distribution of water, and better management of range and livestock.

Conservation programs have played an important part in this increased production from western rangelands.

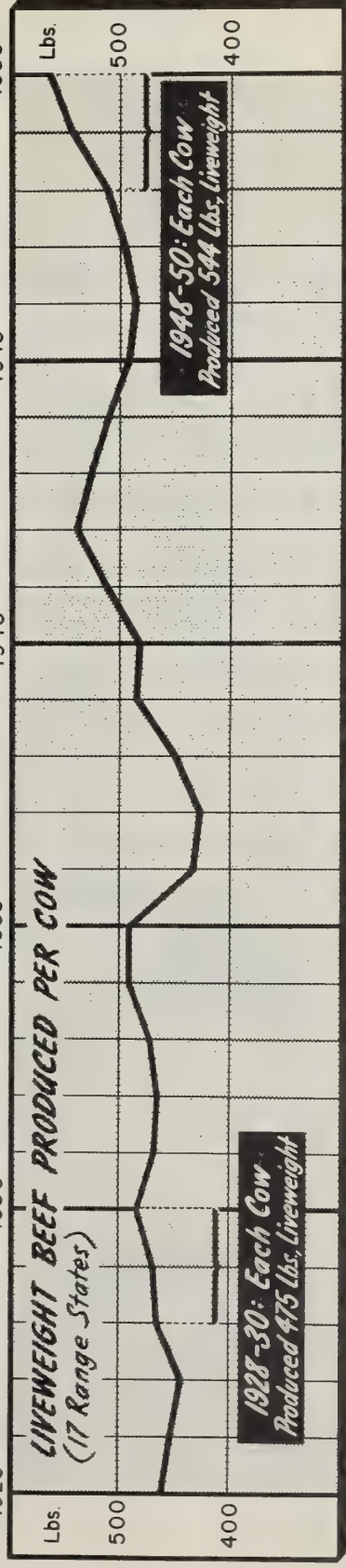
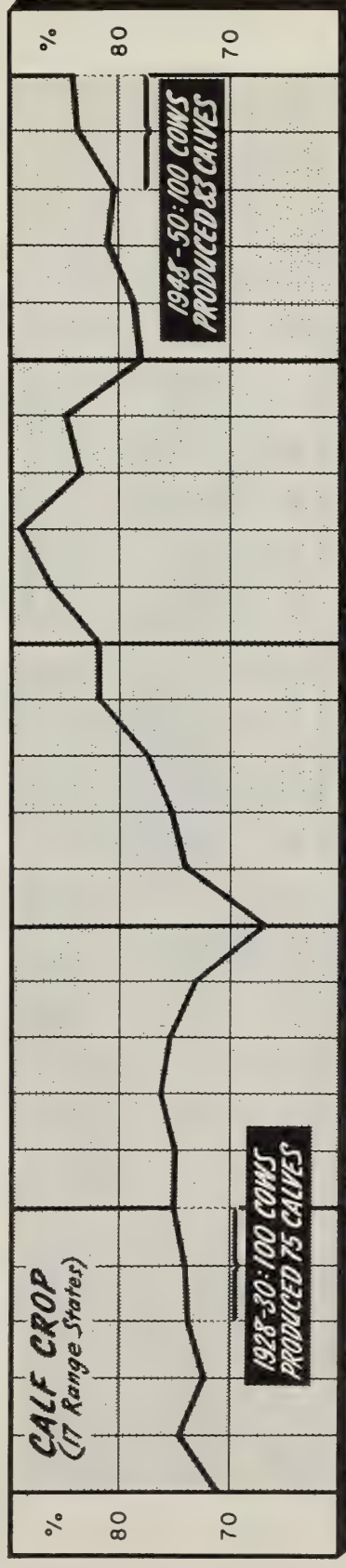
Eighty-seven cows on the western range today are doing the job that it took 100 cows to do 20 to 25 years ago. Every 100 cows in the western range States are now producing 8 more calves than in the 1928-30 period.

Each cow on the western range is now producing 69 pounds more live-weight beef per year than during the 1928-30 period, an increase of 14.4 percent.





# WE CAN BUILD UP ACRES BY IMPROVING THE RANGE



## ACP RANGE CONSERVATION HAS HELPED...

- 930,000 water developments since 1935
- 182 million acres of deferred grazing
- 52 million acres reseeded artificially
- 25 million acres competitive plant control

Seldom can the goal of conservation and high productivity be achieved by a single practice. The greatest value from conservation practices to both the farmer and the public results when they are used in combination.

Greatest benefits also are realized when the services of all agencies and groups can be used in combination. The Agricultural Conservation Program recognizes this fundamental.

In the program for this year ACP assistance is based on the practices most needed on each farm. Working toward accomplishment of a specific conservation plan is encouraged.

Farmers who have worked out definite conservation plans with the help of SCS or some other agency are being encouraged to make full use of those plans, fitting in ACP assistance where it will do the most good.

Farmers who may have no specific conservation plan now are being encouraged to develop one, using the services and facilities of all agencies available.



**WE CAN BUILD UP ACRES  
FASTER AND BETTER...**



*by using the  
RIGHT COMBINATION  
of practices  
PLANNED TO FIT THE  
FARMER AND HIS LAND*

**COMPLETE CONSERVATION  
PLANS DEVELOPED BY  
SCS FOR MORE THAN  
ONE MILLION FARMS**

**ACP ASSISTANCE  
IS MOST EFFECTIVE  
ON PLANNED FARMS**

The estimates of needed increases in production shown in the preceding charts are conservative. Mobilization for defense itself increases the rate of food consumption. Special military needs must be met during the emergency period.

This Nation's huge industrial machine is leaning more and more on agriculture as a source for raw materials. Soybeans, for example, are the raw material for more than 400 manufactured products.

The population is growing at the most rapid rate in this century.

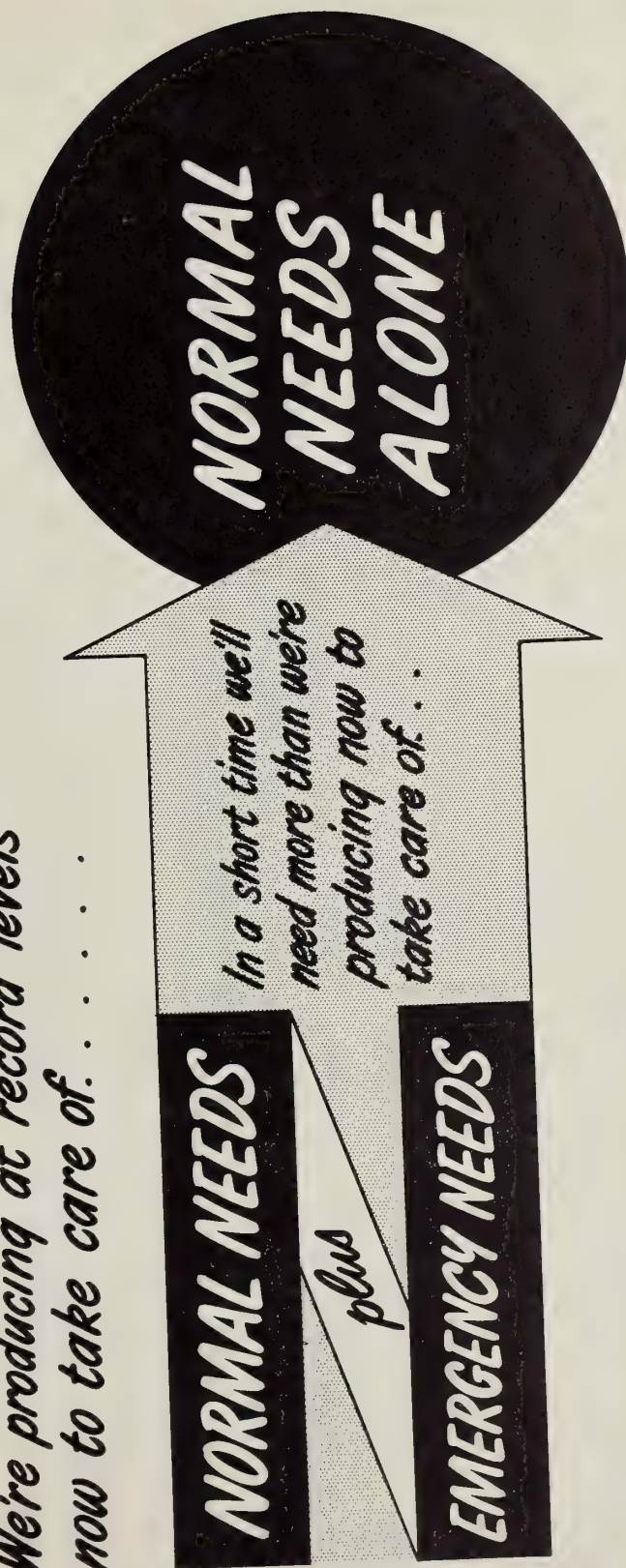
Nutritional standards are for a large part of our population still too low for good health. Recent surveys show that to meet the minimum dietary standards established by the National Research Council, 40 percent of the families need more calcium supplied by milk; 20 percent need more vitamin C and some of the B vitamins supplied by fruits and vegetables; and 10 percent need more protein and iron supplied by meat and eggs.

To meet these minimum standards would require still greater increases in production than the amounts shown in the preceding charts.



# ***FUTURE FOOD REQUIREMENTS ARE LARGE***

*We're producing at record levels  
now to take care of. . . . .*



The total number of acres from which crops are harvested has remained fairly constant since 1920, except for a few bad years.

In 1920 there were approximately  $3\frac{1}{4}$  of these acres for each person in the United States. Now there are only about  $2\frac{1}{4}$  acres for each person.

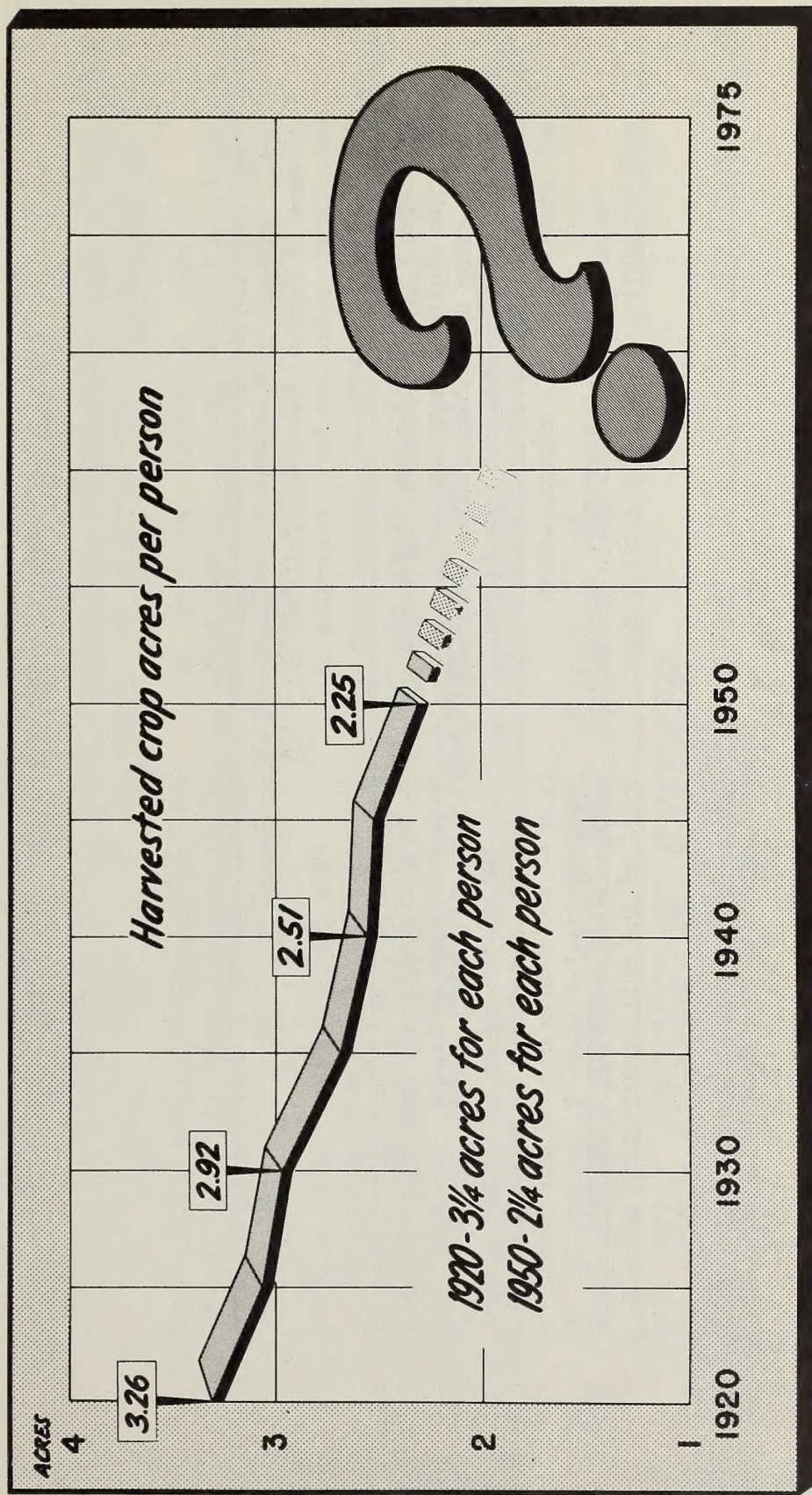
This acreage corresponds roughly to the curb-to-curb area of a standard city block. Two and a quarter acres are about the same size as the city blocks in old Alexandria, Va., which George Washington helped to lay out.

The decrease in the number of harvested crop acres for each person is due to the rapid rise in population. With the population still rising, the number of crop acres for each person can be expected to decline further.

The production from the  $2\frac{1}{4}$  acres of harvested cropland now available for each person must be shared, in part, with other nations. The United States and Canada comprise one of the four large food-producing areas still outside the Iron Curtain. Some of our production is needed to help friendly nations abroad.



# YOUR SHARE OF THE CROP ACRES IS GETTING SMALLER





"On many farms soil fertility is still on the down grade. On our most productive lands in the Midwest and the Great Plains, for example, exploitive systems of farming have been followed on most farms since the very beginning of American agriculture.

"The inherent productivity of the soil has declined continuously, and is still going down. Gains from programs for soil conservation and from increased use of chemical fertilizer have not offset losses from soil deterioration.

"Reversing the downward trend in soil productivity would give another sharp

rise in crop production. Herein lies one of our greatest opportunities for expanding the capacity of American agriculture to produce.

"The job we face is one of bringing the majority of the land now in use -- both naturally fertile and infertile soils -- to a high level of economic production on a sustained basis.

"We need to offset soil deterioration generally, and on many soils go even further -- build them up to higher levels of productivity."--Robert M. Salter, one of the Nation's leading soils scientists, now Chief of the Soil Conservation Service.



## *OUR SOIL FERTILITY IS STILL GOING DOWN...*

- MANY ACRES ARE BETTER, DUE TO SOIL IMPROVEMENT*
- BUT THE ACRES THAT ARE LOSING IN FERTILITY OUTNUMBER THOSE THAT ARE GAINING*
- OUR SOIL IS NOT BEING IMPROVED FAST ENOUGH TO OFFSET THE DECLINE*
- WE ARE STILL USING UP MORE PLANT NUTRIENTS EACH YEAR THAN ARE BEING RETURNED TO THE SOIL*

*The food requirements of the future demand...*

- THAT SOIL LOSSES BE CHECKED*
- THAT SOIL FERTILITY BE BUILT UP*



**WE'VE TALKED ABOUT ONLY THE NEXT 25 YEARS  
CONSERVATION PROGRAMS MUST LOOK MUCH FARTHER AHEAD...**

